U. S. DEPARTMENT OF AGRICULTURE

FARMERS' BULLETIN No. 1437

SWINE PRODUCTION

THE HOG is by far the most valuable farm animal in utilizing farm wastes and in converting the concentrates raised on the farm into a marketable product.

Farmers of the prosperous parts of the country long ago recognized the merit of the hog as a money-maker. Farmers in certain other parts of the country who heretofore have been confining their efforts to grain production are beginning to look to the hog for assistance to make ends meet or to produce a profit.

Without the hog, profits in the big cattle-fattening industry of the Central West would be jeopardized.

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SWINE PRODUCTION

By E. Z. Russell, *Animal Husbandman, in Charge of Swine Investigations, Animal Husbandry Division, Bureau of Animal Industry*

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HOG-GROWING SECTIONS OF THE UNITED STATES

ALL REGIONS of the United States may be considered suitable for raising hogs, inasmuch as feeds used to grow and fatten hogs can be produced to a greater or less extent in practically every part of the country.

That section of the country commonly called the Corn Belt is superior to other sections because of the fact that corn, the principal feed used in fattening hogs, is produced in such abundance. In addition to corn, alfalfa, which is undoubtedly the best pasture plant for hogs and the best relished hay crop, can be produced in most parts of the Corn Belt. Many other pasture plants on which hogs do well also can be grown successfully in this section.

It is a common mistake to think that hogs can not be raised successfully in some parts of the country. Corn is not the only feed on which hogs will fatten. In some years there is such a large surplus of corn in the Corn Belt that it is a disadvantage to the hog producer. A supplement containing a considerable amount of protein (bone and muscle building material) should be fed in addition to corn. Such protein is usually fed in the form of tankage, fish meal, shorts or middlings, or old-process linseed meal, all of which must be purchased. Oftentimes these feeds are high in price when corn is low, and in consequence the low-priced feed is used exclusively, without the best results. Alfalfa contains a higher percentage of protein than other pasture plants in common use, and this fact makes it more valuable as a pasture and also as a hay for hog feeding.

The Corn Belt is the source of supply for large quantities of pork products, particularly hams, bacon, and shoulders, that are consumed in other parts of the country. In recent years farmers of the Southern States have been giving the question of hog growing a great deal of study, with the result that the business is increasing in that section. In most parts of the South an abundance of pasture crops can be produced, which is a distinct advantage in raising hogs. In some sections hogs may be on pasture 12 months in the year. Cowpeas, soy beans, and peanuts are leguminous crops that can be successfully grown in different sections. Corn grows readily

in many sections, and feeders report success with cassava, chufas, and sweet potatoes.

On many farms, particularly in the New England States and on specially equipped feeding lots near large cities, the feeding of garbage is carried on somewhat extensively. Garbage-fed hogs do not make so rapid gains as corn-fed hogs, but they produce pork of equally good quality. Farmers' Bulletin 1133, Feeding Garbage to Hogs, discusses this subject in detail.

Soy beans are a rich protein feed, and should be fed only when supplemented by corn or some other carbohydrate. When soy beans are fed alone satisfactory gains will not be made, and if fed alone for any considerable time the hog carcasses will not be firm. Extensive experiments conducted by the United States Department of Agriculture cooperating with the State agricultural experiment stations of most of the Southern States showed that when hogs starting at approximately 100 pounds weight are fed peanuts alone for 60 days a soft carcass is produced and that it is impossible to produce a hard carcass by feeding corn and tankage or corn and cottonseed meal to soft hogs for a subsequent period of 60 days.

Later results have shown that 100-pound pigs fed on peanuts during a period of 60 days are made firmer by subsequent feeding of hardening feed. However, it is yet impossible from these data to recommend a practical method of producing a strictly hard carcass from such hogs. The products of soft hogs are such that the packers discriminate against them. In some sections the deductions in liveweight price from standard hard hogs are 1 cent a pound for hogs that grade soft and 2 cents for those grading oily; in other sections 2 cents is deducted for soft or oily hogs, while at other markets a 3-cent deduction is made. However, these deductions should not discourage the production of hogs in peanut-growing sections, as in many cases the reduced price may be accepted and still the producer will be able to show a profit.

In many of the great valleys of the Western States, especially in the irrigated sections, barley and wheat, both of which are used in fattening hogs, grow in abundance. These lands produce good alfalfa, which makes hog growing a possible and profitable business. At the present time a considerable percentage of the hogs slaughtered in the packing plants of the Mountain and Pacific Coast States are shipped from the western part of the Corn Belt. Most of these hogs could be profitably grown in the Western States or near the slaughtering points.

Milk and milk products are always valuable as supplementary feeds for hogs, but should not be used as the whole ration. These products are not necessary for the successful production of hogs, though in dairy districts they form an important part of the hog's ration and are recommended where they may be obtained at a suitable price.

Skim milk and milk by-products, however, may contain disease germs, especially those of tuberculosis, and should be sterilized by cooking before feeding to hogs unless they are known to come from cows that have been tested and found free from this disease.

LOCATION OF FARM FOR HOG RAISING

The feeds necessary to grow and fatten hogs should be given first consideration when the question of location of a farm for hog raising

is being considered. Feeds can be produced more abundantly in some localities than in others. Other factors, such as markets, climate, and quality of soil, also should be studied. Sanitary conditions are more favorable where the land is rolling. If the farm is level and flat, it is advisable to throw up ridges with a scraper or road grader and to feed and house the hogs on these ridges. Good roads and accessibility to market are always to be considered.

NUMBER OF HOGS FOR A FARM

When beginning the hog business, it is best to start with but a few sows, and as the herd increases in numbers a careful study of the farm should be made to determine what crops it will produce most successfully and how and to what extent hogs fit into the general plan for that particular farm. The study of these problems will soon indicate the number of brood sows which can be kept to farrow each year to make the most profit. When this conclusion is reached, this number of sows should be adhered to as nearly as possible year after year. Market prices for hogs or for feeds used in fattening hogs taken alone should not be allowed to determine the number of sows to be bred at any breeding season. The fact should always be kept in mind that prices for both hogs and feed may change very greatly before the time comes to sell the next crop of pigs. The amount of available by-products, such as skim milk, shattered grain from grain fields, unmarketable products from the truck farm, undigested grain in the droppings of fattening steers, and other minor wastes of feed should be taken into consideration when calculating the number of hogs to be raised yearly.

SELECTION OF BREEDING STOCK

It is always advisable to use purebred animals in founding a herd. Too much valuable time and money are lost by starting with low-grade sows and expecting improvement by use of purebred boars. Considering the rapidity with which hogs multiply, the initial cost of one or more good, purebred sows of either the bacon or lard type as foundation animals is such that the outlay is a good business investment.

THE SOWS

In making the purchase of the foundation sows attention should be given to the type of animals to be used. Select sows of uniform type, of the same breed, similar in color, marking, and conformation. Sows of good type and conformation may be found in all the standard breeds. It is generally advisable to buy sows already bred when buying foundation animals. Tried sows or gilts may be used. Too often not enough attention is given the sows in the herd. Hog men depend too much on the boar to produce the quality and type of hogs desired. An old, experienced hog man once said to the writer, "Show me the sows in the herd and I'll tell you the kind of pigs that will be produced." There is a lot of truth in this statement. (See fig. 1.)

First of all, the sow should show femininity. She should have a rather thin neck, good, clear eyes, ears of fair size, yet controlled so they will not cover the eyes and obstruct the sight, and a clean "sow" face, with good width between the eyes. She should be up-

standing, with legs of sufficient length so that the udder will not touch the ground when she matures. The back should be well arched, not too broad. She should have good, smooth, deep sides, and well-rounded hams. The udder should be well developed and have two rows of teats, at least six in each row. Her legs should be strong and well placed under the body, with good feet and short, strong pasterns. Particular attention should be given to the heart girth. It should be full and smooth, with no depression showing behind the shoulders.

The disposition of the sow should receive careful attention. A good brood sow will permit the attendant to be in the pen with her at any time. A cross, nervous, or irritable sow is undesirable and should be eliminated from the herd as soon as practicable. This trait may be hereditary, so it is advisable not to retain the pigs from such a sow in the breeding herd.

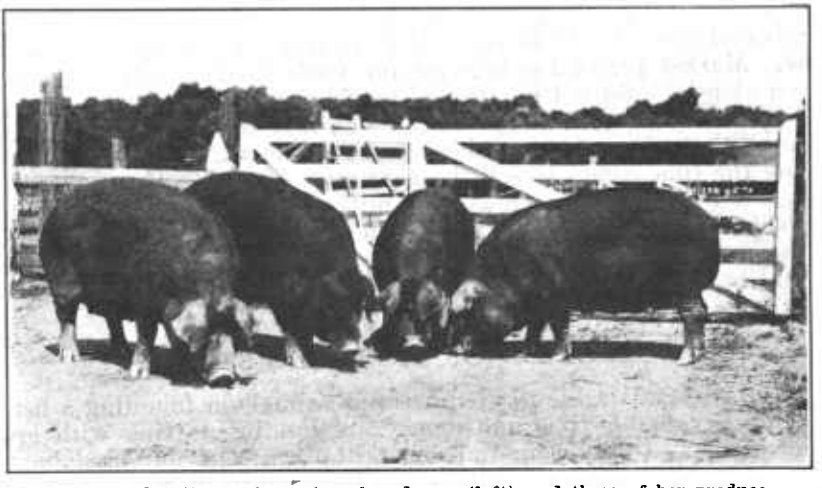

FIG. 1.—Quality as shown in a brood sow (left) and three of her produce

A careful selection of sows raising good-sized litters of pigs that grow out well will soon establish a breeding herd of value. It is not good management to follow the practice of using gilts, having them produce one litter and then fattening all of them for market. The continuous use of immature breeding animals is apt to reduce the vitality and quality of the herd. It prevents also the building up of a good herd of producing sows which have been selected because of their ability to raise good litters of strong, thrifty pigs.

The function of a brood sow is to produce pigs at a profit. The cost of keeping a sow on the farm is the same regardless of the number of pigs she produces. If a sow raises eight pigs to the weaning age, she is more profitable than if she raises only five; therefore prolificacy is a very important essential in selection. Not only the sow to be placed in the herd, but the dam and granddam as well, should come from good-sized litters. If the sow selected is a tried sow, her performance in production should be satisfactory.

Uniformity in type, color, and conformation is highly desirable. This can usually be secured best by making the purchases from one herd. The produce of each individual sow should be observed, and

when pigs from any sow do not conform to the type and growth of the general herd she should be replaced by a gilt from a sow whose pigs show good type and feeding qualities. Careful selection and the elimination of undesirable individuals will enable the grower in a few years to produce animals of uniform type and feeding qualities, which in turn command a better price on the market.

THE BOAR

The selection of a boar is probably one of the most important things that the hog raiser has to do. If possible, everyone having breeding sows should have a boar, although when one has only three or four sows and arrangements can be made with some near-by neighbor who has a boar, it may be advisable not to make the necessary outlay to purchase one. It is very unsatisfactory, however, to take the sows off the place for breeding. Better success will be obtained in getting them "settled" if they can be mated on the place.

Careful study should be made of the sows in the herd in order that faults in conformation may be noted. When the boar is purchased he should be selected with the idea of correcting these faults to as great an extent as possible. It is undoubtedly true that "the boar is half the herd," but success can not be obtained unless quality and type of both the sows and the boar are given careful consideration.

Selection of the boar should be deferred until he is at least six months old. At that age a boar is generally so developed that serious faults may be seen. To tell the outcome of a suckling or weanling pig is practically impossible. It is always advisable in purchasing a boar to see the sire, the dam, and other animals in the herd which are closely related to the one under consideration.

It is better to purchase a tried boar if one of the right type and conformation can be obtained at a reasonable price. If a tried boar is under consideration, the pigs he has sired should be carefully observed to see whether his particular qualities have been transmitted. A boar with good conformation is not always a good sire.

A boar used as a sire should not be discarded until the growing and feeding qualities of his get are determined by a test in the feed lot. Sires of superior quality are not numerous. When the practice is followed of using a boar one season and then marketing him many a valuable sire is sent to the block that should have been retained in the herd.

A boar should not be used before he is 8 months of age, and if he proves a superior sire should be retained in the herd until in the judgment of the owner he should be discarded, which may be at the age of 6 or 8 years or even older (fig. 2).

A herd boar must be handled frequently; consequently his disposition must be given careful attention. A cross, irritable boar, difficult to drive or inclined to fight, should not be selected unless he has some extraordinary qualities that are urgently needed in the herd.

The boar must show masculinity. This is characterized by a strong, wide head, a short, thick, well-crested neck, well-developed shoulders, a strong, well-arched back, well-sprung ribs, and a good covering of flesh. The hair of the boar is generally coarser than that of the sow. His hams should be round and full, his sides even and smooth. Wrinkles or creases in the sides and shoulders are very

objectionable. He should by all means have strong feet and legs. The bone should be of good quality and of sufficient size to carry easily any weight that he may attain. Particular attention should be given to the pasterns, which should be short and straight. When standing at some distance in front of a boar one should easily be able to distinguish him from a sow. His reproductive organs should be clearly visible and well developed. A boar with only one testicle should never be selected.

MANAGEMENT OF THE BOAR

The careful attention of the herdsman is required during the breeding season. An inclosure, preferably under cover, should be provided, in which a breeding crate is placed, and where all the sows should be taken to be bred. A boar carefully and properly handled soon becomes accustomed to a breeding crate and more successful services will be obtained by its use. He should never be

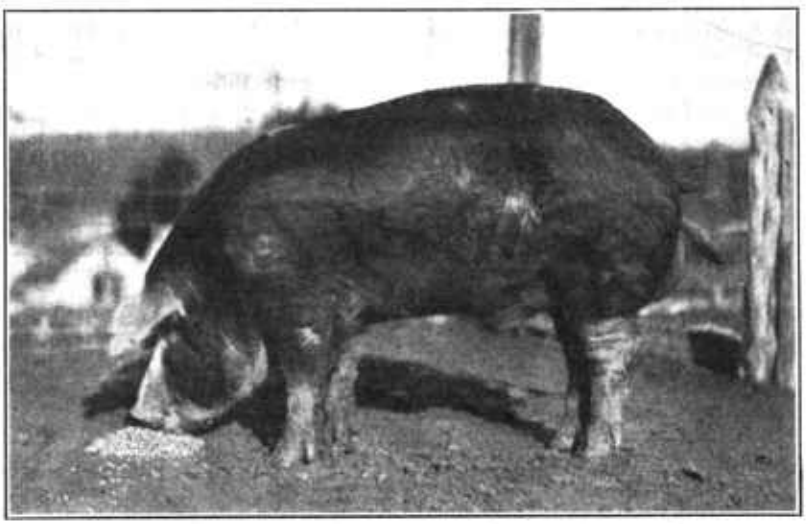

FIG. 2.—Boar of a desirable type

allowed to run with the sows during the breeding season. He should not be confined to a small pen, but should have the run of a good-sized lot or pasture. The boar lot should be convenient to the breeding pen. It is also desirable to have the boar lot so located that breeding sows or other hogs are not placed in adjoining lots or fields. During the breeding season the boar should be undisturbed as much of the time as possible.

One service to each sow is sufficient. A young boar should not be allowed to serve more than one sow each 24 hours. It is best for an aged boar not to serve more than one sow a day, but if necessary a strong, vigorous, aged boar may serve two sows in a day, breeding one early in the morning and the other late in the evening.

The feed given the boar during the breeding season should be abundant and of good quality, in fact all he will clean up twice daily. It is advisable to feed corn in addition to a thick slop of middlings or shorts, to which may be added a small quantity of tankage, fish meal, or old-process linseed meal. When pasture is

not available, alfalfa hay of good quality should be supplied in a rack. Salt and mineral mixture should also be provided.

If a boar becomes restless and gets to "ranting," the trouble may sometimes be overcome by placing a bred sow in the lot with him. Occasionally during the breeding season a boar goes off his feed. If this occurs, put a young boar pig in his lot. The boar frequently will eat the feed offered to keep the pig from getting it.

After the breeding season is over the feed of the boar should be reduced so that he will just keep in a good, thrifty condition. Only a small quantity of corn should be fed at this time, his main feed being middlings or shorts, oats, or a little linseed meal, with the run of a good pasture.

AGE FOR BREEDING SOWS

The age at which a gilt should be bred to produce her first litter may depend somewhat on her development. If the breeder is to get the best results he should select only growthy, well-developed young sows. A well-developed young sow can be bred safely when she is 8 months old, but it is not advisable to breed her before that time. Sows bred at too young an age seldom produce as they should, frequently have trouble at farrowing time, and do not make the best growth after weaning their first litters.

It is advisable not to breed a sow to farrow in the fall after she weans her first litter in the spring at an age of about 12 months. She should have the entire time between weaning her spring litter and being bred in the fall, for growth and development. After she is 2 years old, however, she is fully capable of producing two litters a year.

A brood sow that produces a good-sized litter that is profitable in the feed lot or breeding herd should be retained as long as her usefulness continues. This is often from 6 to 8 years, sometimes longer. The writer had one sow that produced a good litter at the age of 11 years.

A sow will generally farrow in from 112 to 115 days after the day she is bred. In some instances she will farrow in 110 or 111 days and sometimes she may go a few days over 115. By keeping a careful service record, the breeder will be able to determine quite accurately when to expect the pigs and to make his arrangements accordingly. The gestation table on p. 8 is based on a period of 112 days. The first line of dates in each column indicates the dates of breeding and directly opposite is the date on which the sow is due to farrow.

MANAGEMENT OF SOWS DURING PREGNANCY

The result of the year's work with hogs depends more largely on the management and feeding of the sows during pregnancy than during any other period. If the sows are not properly conditioned for farrowing, the pigs will not get a good start, and consequently can not make the growth and profit that they should. Suitable feed and ample exercise are the two most important factors of care during pregnancy. Housing, bedding, and watering have their place and must be given careful attention. In addition to the brood sow keeping up her own bodily functions she must develop the litter. If this is accomplished, a variety of the right kinds of feed must be

Calendar showing dates of breeding and farrowing for sows, based on 112-day gestation period

Date bred	Date due	Date bred	Date due	Date bred	Date due	Date bred	Date due	Date bred	Date due	Date bred	Date due	Date bred	Date due	Date bred	Date due	Date bred	Date due	Date bred	Date due	Date bred	Date due	Date bred	Date due
Jan.	Apr.	Feb.	May	Mar.	June	Apr.	July	May	Aug.	June	Sept.	July	Oct.	Aug.	Nov.	Sept.	Dec.	Oct.	Jan.	Nov.	Feb.	Dec.	Mar.
1	23	1	24	1	21	1	22	1	21	1	21	1	21	1	21	1	22	1	21	1	21	1	23
2	24	2	25	2	22	2	23	2	22	2	22	2	22	2	22	2	23	2	22	2	22	2	24
3	25	3	26	3	23	3	24	3	23	3	23	3	23	3	23	3	24	3	23	3	23	3	25
4	26	4	27	4	24	4	25	4	24	4	24	4	24	4	24	4	25	4	24	4	24	4	25
5	27	5	28	5	25	5	26	5	25	5	25	5	25	5	25	5	26	5	25	5	25	5	26
6	28	6	29	6	26	6	27	6	26	6	26	6	26	6	26	6	27	6	26	6	26	6	27
7	29	7	30	7	27	7	28	7	27	7	27	7	27	7	27	7	28	7	27	7	27	7	28
8	30	8	31	8	28	8	29	8	28	8	28	8	28	8	28	8	29	8	28	8	28	8	29
				9	29	9	30	9	29	9	29	9	29	9	29	9	30	9	29			9	30
	May		June	10	30	10	31	10	30	10	30	10	30	10	30	10	31	10	30		Mar.	10	31
9	1	9	1					11	31			11	31					11	31	9	1		
10	2	10	2																	10	2		
11	3	11	3		July		Aug.				Oct.				Dec.		Jan.			11	3		Apr.
12	4	12	4	11	1	11	1		Sept.	11	1		Nov.	11	1	11	1		Feb.	12	4	11	1
13	5	13	5	12	2	12	2	12	1	12	2	12	1	12	2	12	2	12	1	13	5	12	2
14	6	14	6	13	3	13	3	13	2	13	3	13	2	13	3	13	3	13	2	14	6	13	3
15	7	15	7	14	4	14	4	14	3	14	4	14	3	14	4	14	4	14	3	15	7	14	4
16	8	16	8	15	5	15	5	15	4	15	5	15	4	15	5	15	5	15	4	16	8	15	5
17	9	17	9	16	6	16	6	16	5	16	6	16	5	16	6	16	6	16	5	17	9	16	6
18	10	18	10	17	7	17	7	17	6	17	7	17	6	17	7	17	7	17	6	18	10	17	7
19	11	19	11	18	8	18	8	18	7	18	8	18	7	18	8	18	8	18	7	19	11	18	8
20	12	20	12	19	9	19	9	19	8	19	9	19	8	19	9	19	9	19	8	20	12	19	9
21	13	21	13	20	10	20	10	20	9	20	10	20	9	20	10	20	10	20	9	21	13	20	10
22	14	22	14	21	11	21	11	21	10	21	11	21	10	21	11	21	11	21	10	22	14	21	11
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24	16	24	16	23	13	23	13	23	12	23	13	23	12	23	13	23	13	23	12	24	16	23	13
25	17	25	17	24	14	24	14	24	13	24	14	24	13	24	14	24	14	24	13	25	17	24	14
26	18	26	18	25	15	25	15	25	14	25	15	25	14	25	15	25	15	25	14	26	18	25	15
27	19	27	19	26	16	26	16	26	15	26	16	26	15	26	16	26	16	26	15	27	19	26	16
28	20	28	20	27	17	27	17	27	16	27	17	27	16	27	17	27	17	27	16	28	20	27	17
29	21			28	18	28	18	28	17	28	18	28	17	28	18	28	18	28	17	29	21	28	18
30	22			29	19	29	19	29	18	29	19	29	18	29	19	29	19	29	18	30	22	29	19
31	23			30	20	30	20	30	19	30	20	30	19	30	20	30	20	30	19			30	20
				31	21			31	20			31	20	31	21				20			31	21

given her. She must be in the best possible condition at farrowing time; and even though given all the feed she will eat, she will not be too fat. The principal common feeds used for brood sows are corn, shorts or middlings, fish meal or tankage, old-process linseed meal, bran, alfalfa hay or meal, oats, and barley. Corn is the most common and most important feed used and when fed judiciously with the right combination of the above-mentioned feeds will produce the best results.

Proper management at this time requires that feeding and exercise be linked together. It is better to produce the exercise through a system of feeding than by driving the sows around the lots or fields. A good method to follow is to give the sows all the corn they will eat by scattering ear corn in the stalk fields, requiring them to find it, an ear at a time. In this way they will not get too much and will get the necessary exercise in hunting it. This method may seem wasteful, but it is not, as the sows will get the corn, even though it may be covered to some extent with snow. A clean manure spreader set to scatter the corn thinly is a way to haul it.

A good method of feeding shorts or middlings is to place them in a self-feeder some distance from the water supply and sleeping quarters, allowing the sows to eat all they want. At a convenient place between the waterer or sleeping quarters and the self-feeder place a rack filled with good alfalfa hay, preferably the third or fourth cutting. If this plan of feeding middlings and hay is followed, the corn may be fed twice daily in troughs or on a feeding floor. Mineral mixture should be supplied all the time in a self-feeder.

CARE OF SOW AND PIGS AT FARROWING

About three days before a sow is due to farrow she should be confined to the pen or house where she will be during the farrowing period. The pen should be thoroughly cleaned. It should be dry, well ventilated, about 7 by 7 feet in size, and provided with a guard rail made by placing 2 by 4 inch pieces around the inside of the pen about 10 inches from the floor and from 4 to 6 inches from the sides (fig. 4). This will often prevent the sow from crushing a pig when she lies down.

Remove all the bedding, sweep the floor and sides, and wash with scalding water and lye. When dry, bed the pen with good, clean, dry bedding. Wheat or rye straw, short or chopped hay, and shredded corn fodder are good. Do not use oat straw, as it retains moisture and becomes foul too easily. The quantity of bedding to use should be determined generally by the condition of the weather and by the sow herself. She should be made comfortable. If too little bedding is used, the sow will keep getting up and trying to collect it in a bunch in order to keep herself and the pigs warm.

The sow generally becomes nervous and restless as parturition approaches. She makes a nest for her young. Milk comes down in the teats. Before putting the sow into the pen all mud and filth, especially on her udder, should be removed by washing with soap and warm water. (Fig. 5.)

An attendant should always be at hand during farrowing to give any needed assistance. When farrowing occurs during cold weather a box or a basket should be provided, lined with sacks or other

cloth. In the center of this place warm bricks or a jug of hot water wrapped in cloth to protect the young pigs. (Fig. 6.) The receptacle should be lightly covered to hold the heat. As the pigs

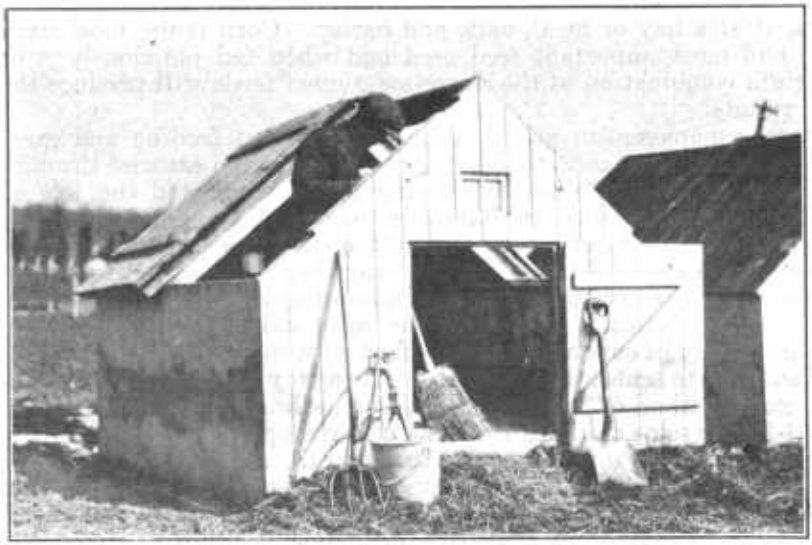

FIG. 3.—Cleaning and disinfecting the farrowing pen before placing the sow in to farrow

arrive they should be thoroughly dried, the navel cord tied with a common cotton string about an inch from the belly, and the cord cut just below the tie. It is good practice to treat the raw edges

FIG. 4.—A well-bedded farrowing pen protected by a guard rail

of the wound with tincture of iodine. After this treatment the pigs should be placed in the box or basket until all are farrowed,

FIG. 5.—Washing the sow's sides and udder before farrowing

provided the time is not more than two or three hours. If farrowing is prolonged, place the pigs to the sow, let them nurse, and return them again to the box or basket.

If any of the pigs appear to be lifeless when born, immediately remove all mucus from the nose, then give them a few gentle slaps on the side with the hand. This may start breathing if there is any life in the body.

FIG. 6.—Protecting the newborn pigs against chilling in cold weather. Jug contains hot water

A pig is born with eight small tusklike teeth, four in each jaw. These should be cut off before the pigs are placed with the sow to nurse. Care should be taken in cutting these teeth not to injure the jaw or gums. Use sharp, side-cutting pliers, cutting about halfway between the jaw and the point of the tooth. Do not attempt to break or pull them. They are very sharp, and if not cut the pigs may bite the sow's teats when nursing, causing her to jump suddenly, possibly injuring or killing some of the pigs. Another reason is that the pigs may bite or scratch one another, allowing infection to start and causing serious trouble. (Fig. 7.)

Each farrowing pen should be supplied with an outside feeding pen or floor, away from the little pigs, where the sow may be fed. This pen should be as wide as the farrowing pen, extending 6 or 8 feet from the building. If the feed is supplied in the farrowing pen, the sow is very apt to cripple or kill one or more of the little

FIG. 7.—Cutting the baby teeth before nursing will help to prevent injuries by young pig

pigs while eating. On the other hand, if the sow is fed outside, she will deposit her droppings there, preventing the bedding from becoming foul or wet.

It sometimes happens that when the sow farrows she will not have any milk. When such cases occur the newly farrowed pigs should be fed cow's milk, undiluted, in small quantities at about 2-hour intervals. This milk may be fed with a nipple or by pouring a small quantity, not more than half an inch in depth, into the bottom of a thoroughly cleaned shallow tin pan. The pigs will rub their noses in the milk and soon begin to drink. Care must be taken not to overfeed them, especially when they are only a few days old.

SOWS THAT EAT THEIR PIGS

It is not natural for a sow to eat her pigs. The desire to do so may result from several causes. It is probably because she has not

been properly fed and cared for during pregnancy. Plenty of exercise and feeds such as are described under "Management of sows during pregnancy" will usually prevent this trouble at farrowing. The afterbirth should be removed from the farrowing pen and burned or buried. Care should always be taken to see that the bowels are in proper condition. If they are not, feed a sufficient quantity (about a pint) of linseed meal or a handful of Glauber salt dissolved in the drinking water or slop.

THE SOW'S FEED

Reduce the richness and quantity of the sow's feed by at least half 24 hours before she farrows. She should have no feed during the first 24 hours after farrowing, but because of her feverish condition she should have plenty of lukewarm water at frequent intervals.

After 24 hours the sow should be given a small feed of a light slop of shorts or middlings, and the same feeds she has had during pregnancy should be continued. The pigs should be closely examined before each feeding of the sow until they are about 10 days old for any appearance of white scours or diarrhea. If this trouble appears, discontinue feeding the slop and give the sow a small quantity of oats, scattered thinly on the floor. Prepare limewater by dissolving a piece of rock lime about the size of a baseball in a gallon of water; after it settles drain off the water and give it to the sow to drink; also bathe the sow's udder and teats with some of the limewater. The pigs which are scouring should be given five drops of diluted formalin (on the tongue), prepared by mixing 1 ounce of standard strength formalin and 1 pint of water.

The feed of the sow should be gradually increased, adding some corn to the ration about the third or fourth day after farrowing. When the pigs are from 10 days to 2 weeks old she should be on full feed and have all the good feed she will eat. She should then be removed from the farrowing pen to a lot or field containing good pasture of some sort, if pasture is available; if not, move her to some quarters other than the farrowing pen. If possible, the new quarters should be where no hogs have been during the last year or on ground that has been plowed since hogs were there.

Until the pigs are weaned the sow should be given special care. It is not possible to say how much feed she should have; but if best results are obtained in growing the pigs, she must have all she will clean up twice daily in addition to pasture. Corn or ground barley should be the main feed, supplemented by shorts or middlings, tankage or fish meal, or old-process linseed meal. The corn may be fed on the ear or shelled. The other feeds may be fed dry or in slop. Abrupt changes of the feed of hogs of any age should be avoided. When a change of feed is necessary, make it gradually by slowly reducing the former feed and increasing the new feed. A box or self-feeder containing the mineral mixture suggested on page 21 should be available at all times.

MANAGEMENT OF PIGS DURING SUCKLING PERIOD

During the suckling period sows and pigs should always be provided with dry, warm, well-bedded sleeping quarters, where they

may go in comfort at any time. The bedding must be watched carefully and changed whenever it becomes foul or wet.

The hog is one of the best and most profitable means of converting the grain and a part of the pasture crops of the farm into edible meat. If the greatest profit is to be returned to the feeder, the pigs must make maximum gains all the time. The profitable pig is one that never stops growing from farrowing to market.

When pigs are about three weeks old they will need something to eat in addition to the mother's milk. A creep should be provided containing a self-feeder filled with shelled corn. When constructing the creep leave an opening at one or more places sufficiently wide and high to permit the pigs to walk in and out freely. Build the sides close to the ground so that they can not crawl under. (Fig. 8.) If pigs

FIG. 8.—A creep should be so arranged that the pigs may get their feed undisturbed

enter the creep by crawling under there is always an unnecessary waste of energy, and poor development of the backs of such pigs occurs. There should be free access to a mineral mixture (see p. 21) by placing it in a small self-feeder at the end of the larger one or supplying it in a separate compartment of the grain feeder.

When the pigs are about five or six weeks old, some protein supplement to the corn should be provided. Shorts or middlings of good quality are very desirable for this purpose. This feed should be fed separately from the feeder and not be mixed with the corn. Tankage or fish meal or old-process linseed meal may be used as a substitute for shorts or middlings.

At the United States Experiment Farm, Beltsville, Md., sows suckling their pigs have been fed for three years by a self-feeder contain-

ing shelled corn, middlings, and mineral mixture in separate compartments. The results have been as good as or better than by hand feeding twice daily. (Fig 9.)

THUMPS

The term "thumps" as here used refers to a peculiar yet well-known spasmodic action of the diaphragms of pigs less than three weeks of age; it is not necessarily associated with respiration. Little pigs must be watched closely for the appearance of this condition. It usually occurs when they are from 5 to 15 days old and is caused by their overfeeding and not taking sufficient exercise. The fattest, best pigs in the litter are the ones to be affected first. Plenty of exercise and sunshine will prevent the trouble. If the weather is bad and the pigs do not get out, they must be forced to take exercise. Use a switch and chase them around the pen or along the alley of the hog house until they become tired. Repeat this three or four times a day until the threatened trouble disappears.

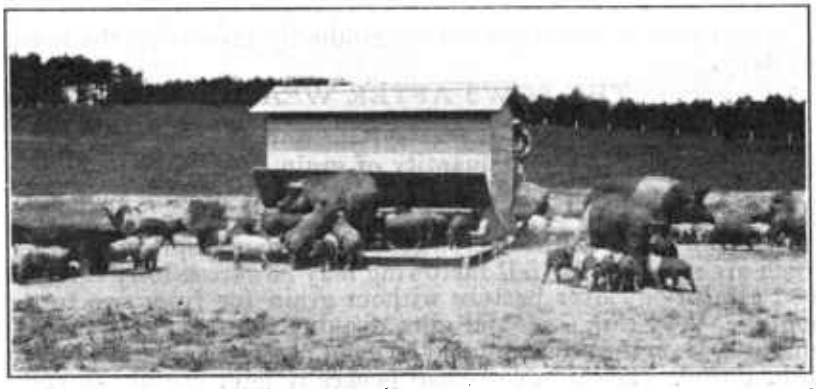

FIG. 9.—Self-feeders may be profitably used for sows and pigs during suckling period

CASTRATION

Pigs should be castrated while they are still suckling their dams—early enough to allow plenty of time for the wounds to heal thoroughly before weaning. For detailed information on this subject consult Farmers' Bulletin 1357, Castration of Hogs.

WEANING THE PIGS

Hog raisers differ widely in their opinions as to the proper age at which pigs should be weaned. Pigs are weaned at all ages from 5 to 12 weeks, or even older. The mother's milk is the natural and best food for a pig and should be used to the greatest extent possible. A good brood sow properly fed and handled will furnish a good flow of milk until the pigs are from 10 to 12 weeks old. A sow that will not suckle well for this period should be discarded from the herd.

Unless there is some special reason for doing otherwise, pigs should not be weaned until they are at least 10 weeks old. Some breeders wean at an earlier age to get two litters a year. Generally this is not necessary. A better practice is to raise three litters in two

years. A pig that is stunted by early weaning or from any other cause will never make so profitable a hog as it would if this setback had not occurred.

When the pigs are to be weaned, reduce the richness and quantity of the sow's feed four or five days before weaning. This will have a tendency to reduce the flow of the milk. Then remove the sow from the pigs, leaving them in the same quarters where they were during the time they were suckling, with access to the self-feeder.

If the sow is handled in this manner it will seldom be necessary to milk her to prevent a caked udder. If the udder becomes too full, return the sow to the pigs to suckle and remove her as soon as they have finished. It is rarely necessary to return the sow to the pigs more than once.

After the pigs are weaned do not change the ration. Leave them on good pasture, with access to the self-feeder containing corn, shorts or middlings, tankage or fish meal, and mineral mixture. If at any time while the pigs are suckling or after they are weaned skim milk or buttermilk is added to the ration; commence feeding the added feed in small quantities, gradually increasing the amount fed daily.

THE SOWS AFTER WEANING

After the pigs have been weaned the sows should be placed in pastures and given a small quantity of grain. The quantity of grain needed must be determined by the quality of the pasture and the condition of the sows.

Sows two years old or over which have weaned spring litters and which are not bred for fall farrowing may be successfully carried on good alfalfa or clover pasture without grain for from two to three months. Very thin sows and gilts weaning the first litter should be separated from the others, placed on good pasture, and given a liberal grain ration. The thin sows will generally gain rapidly enough to be taken out in 30 days, but it is desirable to feed gilts some grain during the entire period between the weaning of their first two litters.

All hogs require close attention, regardless of age or sex, but the best proof of the herdsman's skill is in caring for and managing the brood sows of the herd.

TWO LITTERS A YEAR

The question of raising two litters a year is one on which no positive advice can be given. Much depends on where the hog grower is located, his equipment for handling pigs during the winter, how the scheme fits into his farming operations, and other local problems. Fall pigs require a great deal of attention, and most farmers are not in position to care for as many fall pigs as spring pigs. The age at which pigs are weaned has much to do with raising two litters a year. Best general results will be obtained if pigs are allowed to nurse their mothers for at least 10 weeks. (This question is discussed more fully under "Weaning.")

In the northern half of the United States fall pigs should not be farrowed after October 15. If farrowed at a later date, they will not have sufficient time to become well started before cold weather sets in. Throughout the country a large percentage of the spring

pigs are farrowed in March and April and fall pigs in September and October. If a sow farrows March 15 and the pigs suckle 10 weeks, they will be weaned May 24. If the sow is in good condition, she will come "in season" three or four days after the pigs are weaned and may be immediately rebred. If she is rebred May 28, she will farrow September 16. These pigs would be weaned November 25, which would allow rebreeding for farrowing March 20. It is not always possible to get a sow settled at the first service and this uncertainty makes it difficult to assure farrowing at the proper time; therefore the raising of two litters a year from all the sows in the herd is impossible.

If the pigs are allowed to suckle 10 weeks, as they should be, it is easily possible for a good sow, on the average, to raise three litters every two years. This is a good average and would probably meet the requirements of most farmers and show the best net profits in the end.

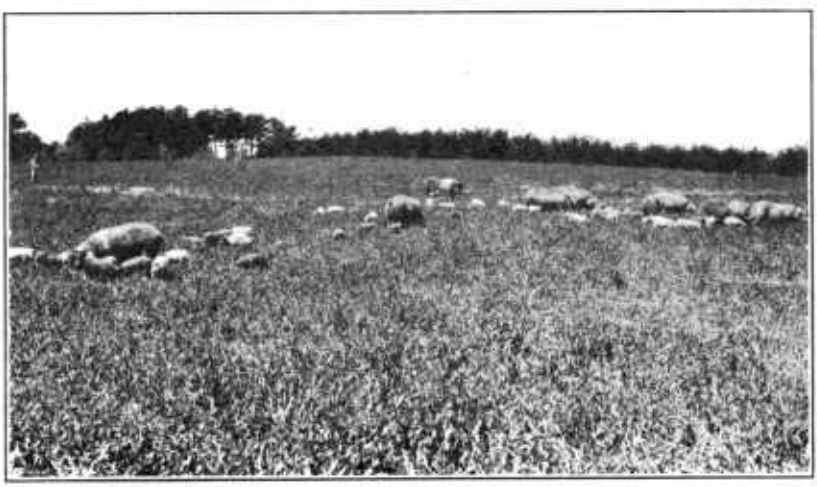

FIG. 10.—Sows and pigs on rye pasture

FALL PIGS

Pigs farrowed in the fall require more attention than those farrowed in the spring. This applies more particularly to the northern part of the country than to the South. During the winter in all parts of the country fall pigs should have easy access to comfortable, dry, well-bedded quarters. In the North, where snows are frequent, pigs running in and out naturally carry in more or less moisture, causing the bedding to become damp. Pigs should never be required to sleep in damp bedding; consequently the bedding must be watched closely and changed often.

A constant supply of water is always needed. In cold regions the open-trough plan of watering is seldom efficient. An automatic, heated waterer should be provided.

In the southern part of the country winter pasture of some kind can generally be provided. Fall pigs, as well as other hogs, should always have access to winter pasture. (Fig. 10.)

HOG PASTURES

Pastures for hogs are valuable and should be utilized to as great an extent as possible. The best use of pastures, however, does not mean that hogs fatten or even make satisfactory growth on pasture alone. Pastures of any kind, regardless of quality, must be supplemented with grain if the most satisfactory results are to be obtained.

The hog grower should never attempt to supply only just enough pasture. Pastures will not produce the best results if they are grazed closely. Only as many hogs as can be provided with an abundance of feed should be placed in any lot or pasture. It is impossible to say how many animals may be grazed on an acre, since so much depends on the crop used, the quality of the soil, and climatic conditions. Ordinarily an acre will furnish pasture for from 5 to 15 hogs averaging 100 pounds. It is a good plan to have two pastures for each lot of hogs. By alternating them the pastures may be grazed fairly closely and still provide good, succulent feed.

FIG. 11.—A breeding herd on alfalfa pasture

Pasture crops that are allowed to mature do not furnish good feed for hogs.

The fertilizer value of the manure which is left on the land is an indirect and generally unnoticed value that should be taken into account when hog pastures are being considered. Hogs on pasture range all over the inclosure; consequently the distribution of the manure is quite uniform. Furthermore, very little of it is lost. The value to be derived from hog pastures does not apply to any particular locality or section of the country. The only difference in different sections is the length of the pasture season.

The value of good pastures to breeding animals can not be overestimated. To give a maximum of efficiency the breeding sow and boar must have exercise and a variety of feeds. There is no other way by which exercise and variety of feeds can be supplied as well as by giving the animals free range on a good pasture. (Fig. 11.)

PERMANENT PASTURES

In most of the hog-growing sections of the country permanent pastures are generally used by hog raisers. It is not advisable, however, to use any of the permanent pasture grasses in small lots or

where a considerable number of hogs are kept on them during most of the pasture season. Where hogs are kept in any considerable numbers in an inclosure it is always advisable to plow such lots or pastures once each year, though twice a year is better.

Many successful hog growers place on their permanent pastures only a limited number of hogs, such as will permit the pastures to make a sufficient growth to produce a crop of hay. Plants most generally used for permanent pastures are alfalfa, red clover, alsike, white clover, bluegrass, bur clover, Bermuda grass, lespedeza, carpet grass, crab grass, and Dallas grass. The first five are used in the northern half of the United States. Bluegrass and white clover are generally grown together. Timothy is often grown with red clover. The other plants are grown in the southern parts of the country. All the plants grown in the North are to a greater or less extent grown also in the South. Of all the permanent pasture plants alfalfa undoubtedly heads the list for hogs. In localities where this plant can be successfully grown no other permanent pasture is necessary.

TEMPORARY PASTURES

Temporary pastures are used on nearly every hog farm, and are valuable as a supplement to permanent pastures or on farms where there are no permanent pastures. Every barnyard and small lot where hogs are kept should be plowed and seeded at least once a year. These lots are usually well fertilized and produce abundantly.

The most common temporary pastures are rye, oats, wheat, rape, soy beans, and cowpeas. These various pasture plants are grown in practically all parts of the United States. Seeding for temporary pastures should be much heavier than for a grain crop. Rye may be sown in the fall from the 1st of September to December, depending on the locality. In the northern parts of the country it may be grazed until covered by snow or made worthless by freezing. It comes early in the spring and may be grazed until May. If the growth is very rank, it is sometimes advisable to clip it with a mowing machine, setting the cutting bar as high as possible. In the South it may produce good grazing all winter. Winter wheat can be handled in much the same way. In sections where winter oats are grown the crop can be pastured much the same as rye. In the North oats sown in the spring make a good pasture while they last, but the pasture period is short. Rape is often sown with oats in the spring. When rape is sown the Dwarf Essex variety should be used. This crop may be seeded from early spring until summer. When the plants are from 6 to 10 inches high the crop may be grazed quite heavily. It will keep growing and produce good, succulent feed if the season is right. Seed from 4 to 6 pounds to the acre. Cowpeas and soy beans are sown in the spring and are often planted together. In a good growing season very satisfactory results may be expected from these crops.

Dallas grass is a perennial and sweet clover is biennial; the former is grown in the South and the latter in nearly all sections. Both make very satisfactory pastures for hogs. Dallas grass grows well in low, moist lands, makes a good growth in warm weather, and withstands close grazing remarkably well. Sweet clover grows

rapidly in good soils and should be grazed heavily to keep the plants from becoming tough and fibrous.

FENCES

If pastures are utilized to the greatest extent, the various fields and lots must be fenced "hog tight." This is most easily and economically done with woven-wire fencing. When 10-acre or larger fields are fenced, it is best to use a fence 26 inches in height, and it is advisable to place one strand of barbed wire at the bottom of the woven fencing just above the ground. Hogs are more easily kept in large inclosures than in small ones; consequently if the inclosures are small a higher fence will be necessary, say 32 or 36 inches.

Most essential of all in constructing a woven-wire fence is to have good, well-braced corner posts. Probably 90 per cent of the efficiency of a woven-wire fence is in the setting and bracing of the corner posts, making possible the stretching of the wire taut. An animal will soon locate a weak spot in a fence and render it practically useless. Regardless of how taut the fence may be when first constructed, it can not remain that way if the corner posts give in the least. When it is found necessary to construct a temporary fence around a small area, it may be made by using 6-inch fence boards, made into panels, and attaching them to temporary posts or stakes driven into the ground, or by using 26-inch woven-wire fencing which may be unrolled and again rolled after using. The latter method, however, is not very satisfactory, as woven wire is not easily rolled in the field.

MINERAL MIXTURES

Mineral substances in the diet of hogs are just as necessary as the organic matter (protein, fat, and carbohydrates). All vegetable feeds contain certain amounts of sodium, potassium, calcium, magnesium, phosphorus, iron, sulphur, etc. Cereal grains, however, do not furnish these elements in sufficient amounts to satisfy the proper requirements for nutrition and growth. It is necessary, therefore, to supplement the ordinary rations with mineral mixtures.

One of the most essential mineral substances for proper nutrition in animals is ordinary salt (sodium chloride), since this compound enters into the composition of all body tissues, gland secretions, blood, lymph, etc. Phosphates and carbonates of lime and magnesium are necessary for the development and solidity of bones, and must be available in sufficient quantities if normal growth is to be attained. Since the leaves of plants contain more ash than the seeds and stalks, hogs which are pastured on alfalfa, clover, or other grazing crops obtain much of the minerals required; but where pastures are limited or where dry-lot feeding is practiced supplemental mineral feeding is necessary.

At the United States Experiment Farm, Beltsville, Md., the following mineral mixture is giving satisfactory results:

Charcoal	75 (3 bushels) pounds
Raw phosphate rock	3 pounds
Salt (sodium chloride)	6 pounds
Ground limestone (calcium carbonate)	6 pounds
Flowers of sulphur	3 pounds
Copperas (pulverized sulphate of iron)	1 pound
Glauber salt	6 pounds

Where raw phosphate rock and limestone (raw calcium carbonate) can not be procured in finely ground form, the phosphorus and lime may be obtained from raw bone meal and wood ashes.

A mineral mixture should be supplied to hogs in boxes or self-feeders where it will remain dry and be available at all times. A small separate compartment in the self-feeder used for grain feeding makes a convenient combination. Finely granulated or pulverized charcoal is desirable for mixing with the mineral substances and is far superior to soft coal which is frequently used. Neither charcoal nor coal has any food value, however, and it is a mistake to regard charcoal as valuable except for the purpose of keeping the alimentary tract sweet through the absorption of gaseous compounds which are developed during the digestive processes.

WATER

One of the most important matters and one very often neglected is the water supply. Many hogs get their water supply by the herdsman's pouring a quantity of water into a foul, dirty trough twice a day. This system of watering is far from being adequate and should not be followed. Every lot or field in which hogs are kept should be supplied all the year with running water, or some system should be installed whereby the supply is automatic and the hogs have water whenever they want it.

THE FATTENING STOCK

There are two general plans to follow after weaning in getting the hogs ready for market. One is to keep them on a good growing ration until about 60 to 75 days before it is proposed to sell them, feeding them during the last period on a full feed of corn and tankage or fish meal. The other plan is to keep them on full feed all the time until they attain a market weight. The better plan to follow may depend somewhat on market conditions, but more largely on the system of feeding which is best fitted to the particular farm and how it fits into the general farm plan. In either event a pig should never be fed so sparingly that it fails to make gains. The cost per pound of gain must always be considered. If the plan of growing first and fattening later is followed, grain not less than 2 per cent of the body weight of the hog should be fed daily in addition to pasture. Corn or ground barley is the best feed to use. During the fattening period it is advisable to leave the hogs on good, nutritious pasture if available and to give them all the corn or barley they will eat, supplemented by tankage or fish meal. These feeds may be fed either by hand or self-feeder. In either event they should be fed separately. The appetites of individual hogs vary, and when feeds are fed separately the hogs may choose their feeds, but when the feeds are mixed some hogs may not eat as much as they require because they are compelled to eat something not palatable to them. (Fig. 12.)

If the hogs are pushed from weaning time to market, probably the most economical plan is to have them on good pasture with free access to shelled corn and tankage or fish meal in self-feeders. Middlings or shorts of good quality, or old-process linseed meal, may be fed instead of tankage or fish meal. The price should be the controlling factor as to which should be fed. Hand feeding may be

substituted for self-feeders, but it takes more time and generally the gains will not be made so economically.

A successful and economical plan of fattening hogs is to "hog down" the corn, also letting the hogs have access to a good alfalfa or red-clover pasture and tankage or fish meal in a self-feeder. The

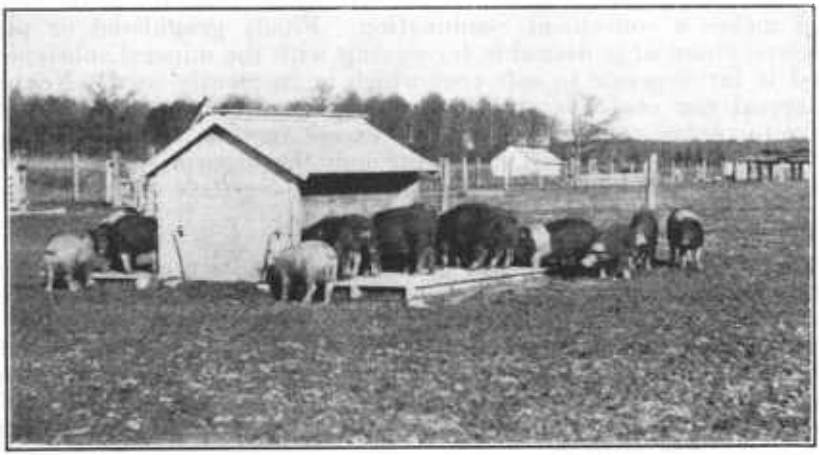

FIG. 12.—Self-feeders reduce labor costs in fattening hogs

hogs will harvest all the corn in this way and in addition help build up the fertility of the soil. (Fig. 13.)

Under any plan of feeding, free access to good, pure, water and a mineral mixture containing salt is necessary at all times.

Based on a series of years, hogs weighing from 190 to 235 pounds will command a better price, at least three-fourths of the time, than hogs of lighter or heavier weights. It is impossible to say when

FIG. 13.—An economical and profitable way to harvest the corn crop

fat hogs should be marketed, but a safe plan is to sell when they are at a market weight which commands the best price at the time. No one can foretell future prices; consequently if the producer holds his fat hogs for a better market, he may be sadly disappointed.

FEEDER PIGS

During the last few years there has been an increasing demand for feeder pigs, or pigs weighing generally from 75 to 100 pounds, in some cases up to 120 pounds. This demand comes largely from farmers in the Corn Belt and from men who devote their time to the business of fattening these pigs. Other demands for feeder pigs come from garbage-feeding and serum plants near large cities in different parts of the country.

In the irrigated valleys of the West alfalfa can generally be produced in abundance. In the southern and southeastern sections various good pasture crops for hogs, such as lespedeza, winter oats, rye, wheat, carpet grass, and Bermuda grass can be easily produced. In many of these sections a feed crop necessary to fatten hogs is uncertain, yet it is sufficiently large to be economically used to supplement pastures and make the production of feeder pigs profitable. In view of the demand for feeder pigs at all seasons of the year, the production of these pigs should be given consideration in localities where fattening crops are uncertain. (Fig. 14.)

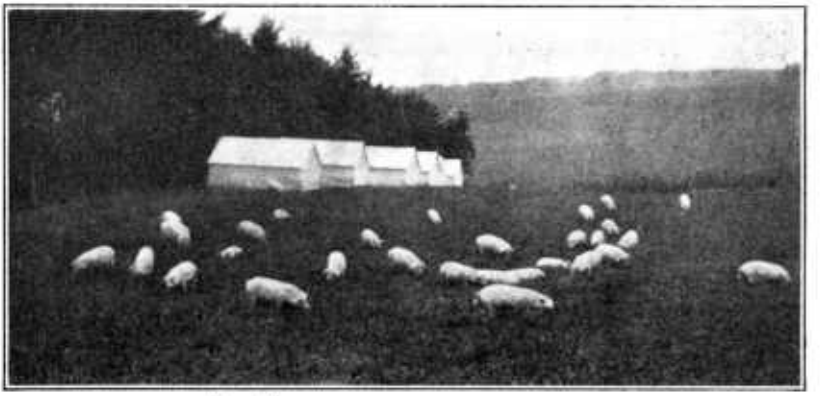

FIG. 14.—Feeder pigs on alfalfa pasture

SELECTING PIGS FOR BREEDING

Every hog grower should look his pig crop over each year and if possible select a few gilts that will be an improvement in the breeding herd. Sometimes there is an outstanding animal that may be selected soon after weaning, but generally it is best to defer the selections until the pigs are from 5 to 6 months of age. By that time they are so well grown that their faults can be detected. A good, tried brood sow should not be replaced by a gilt unless the change is reasonably sure to make an improvement in the quality of the herd. (Fig. 15.)

If possible the gilts selected for the breeding herd should be placed in a good pasture by themselves. While they should not be too heavily fed, they should be given a liberal ration. Corn should be fed only in limited quantities—from one-fourth to one-third of the total feed. Shorts or middlings, to which is added a little tankage or fish meal, fed either dry or in a thick slop, can constitute, with pasture, a very satisfactory ration. Mineral mixture, salt, and

water should always be kept before them. If after the selection has been made any gilt does not develop satisfactorily she should be discarded from the herd and fattened for market.

THE PUREBRED HOG BUSINESS

A beginner in the hog-raising business should get purebred animals for his foundation, but he should confine his efforts to the raising of market hogs for a few years, or until he knows how to mate animals for good results and how to feed them properly. After he has become more proficient in these lines he may be able to embark in the business of growing purebred hogs with good prospects of success.

The method of handling hogs to be used for breeding purposes is somewhat different from that of fattening them for market. Breeding hogs must be fed with the purpose in mind of growing a good frame that will support the body for several years rather than one

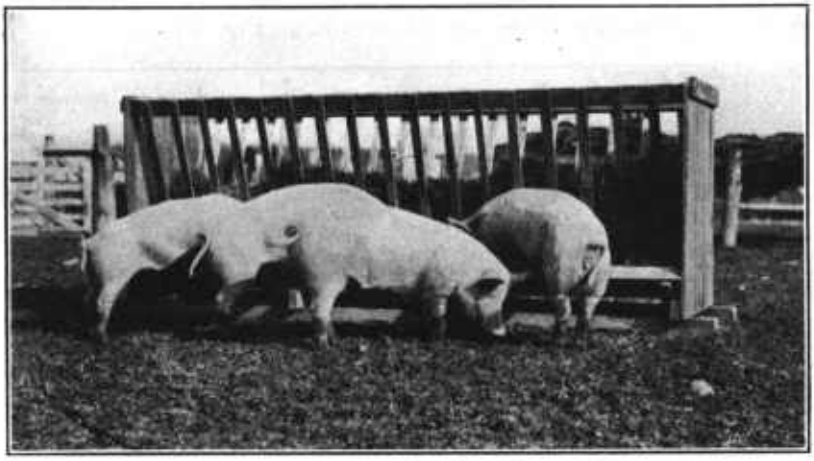

FIG. 15.—Gilts from 5 to 6 months old show qualities as well as defects which indicate their probable value as breeding animals

whose usefulness ends at the age of 8 or 9 months. In order to do this a higher percentage of protein and mineral feeds must be used for the breeding hogs, and they should have the run of a good pasture during the entire time when it is possible to have pastures. The kind of pasture used is of less importance than the fact that pasture is provided. They should have some corn, possibly about one-fourth of the ration, the balance to be made up of shorts or middlings, a little fish meal or tankage, and pasture. Skim milk or buttermilk is recommended if available. Light-weight oats should never be fed, because they are too bulky. Oats may be fed in a self-feeder or scattered thinly on a feeding floor, but should never be fed by pouring them in piles or in a trough. Too many breeders of purebred hogs follow the plan of buying high-priced concentrates and mixed feeds, when feeds that they are growing on their own farms would produce just as good animals at much less cost.

The practice of keeping a registered herd of purebred hogs and selling the offspring for breeding purposes is a branch of the hog

business that may be carried on at a profit, but is often a failure, usually due to unbusinesslike methods. The successful breeder of purebreds must know both the feeding and breeding problems of the business, and in addition must be a good salesman.

KEEPING RECORDS

Some system of identification marks and a book record of them, whereby the pigs of each litter may be known, is always to be advised. If the herd is one from which pedigreed stock for breeding purposes is sold, some system of marking must be followed. The most satisfactory method is by making notches in the ears. In order that no mistake may occur, every pig should be marked at farrowing time. Ear tags of different kinds are used, but they often tear out and the identity of the pig is lost.

If hogs are raised for market only, earmarking the pigs is of great assistance in making selections for the breeding herd. Proper

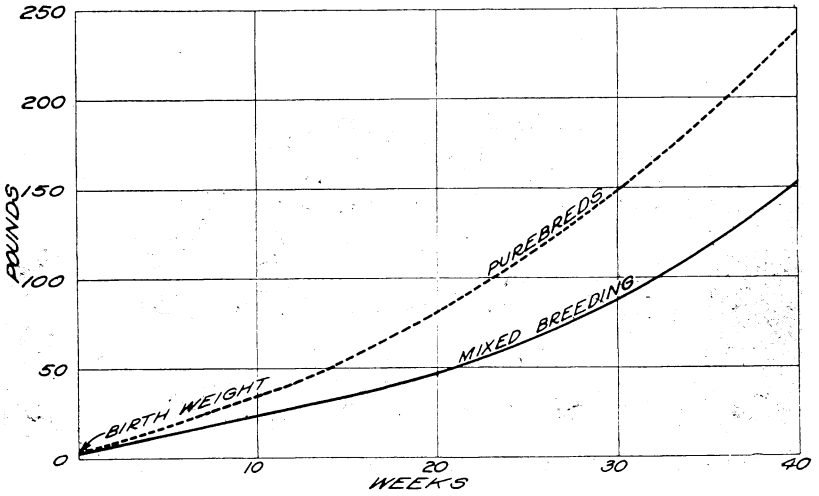

FIG. 16.—Rate of growth of purebred pigs and those of mixed breeding from birth to slaughter. All received substantially the same feed and care

selection can be made only when the dam of the pig is known and her record of performance examined. The date when every sow in the herd is bred should be known and recorded. If this is not done, the herdsman will not know when she is due to farrow and can not intelligently feed and care for her. Such a record can not be made properly unless the individual animals in the herd are earmarked.

Any system of earmarking which is accurate and convenient for the herdsman in the identification of his pigs may be followed. The system indicated in Figure 17 should be satisfactory.

The notches in the ear can be made best with a small, sharp, side-cutting pliers. Little trouble will be experienced in having permanent marks for identification if care is used to include a part of the cartilage of the ear as well as the skin when making the notches. The marks are made best soon after the litter is farrowed, when the wounds heal quickly.

SELLING BREEDING STOCK

The first essential to success in selling breeding stock is in closely culling the herd and offering only animals of merit. The percentage of hogs in the herd that should be culled and fattened for market varies widely. Much depends on the quality of individual animals in the breeding herd and the herdsman's ability to make the best of them by feeding and handling. A herd would be above the average in which 50 per cent or more of the animals should not be culled out and fattened for market.

Two general systems are following in disposing of surplus stock, viz, public and private sale. The public-sale system is quite generally followed and has many advantages. All the stock is sold in one day and the buyer sees what he is buying and names his own price. Among the disadvantages of the public sale are the time and expense in making arrangements, constructing the sale ring, providing the lunch, and the possibility of bad weather, which may make a considerable difference in the prices obtained. The private-sale system calls for a different plan of advertising and requires also considerable correspondence, in which the seller must be very careful in the description of what he has for sale. He should be careful never to over-

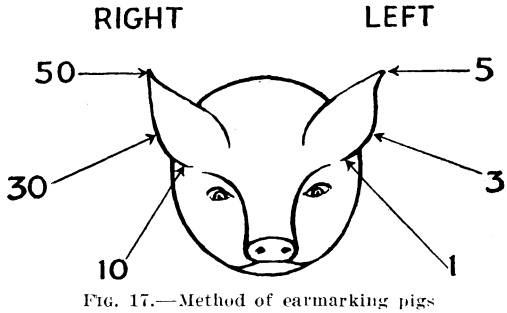

FIG. 17.—Method of earmarking pigs

estimate the quality or value of the animals offered. A common mistake made by breeders of purebred stock is that they do not cultivate the trade of farmers in their own locality. They spend far too much time and money in trying to interest purchasers from a distance. Many bright prospects for success in the purebred business have resulted in failure solely because the breeders have tried to break a record in top prices. Generally the record-breaking price is made because the purchaser gets time in which to make payment. If every transaction in the purebred business were made on a strictly cash basis, the disastrous "booms" would not happen.

SANITATION

Results that may be obtained by following the very best methods of feeding and breeding will be lessened to a great extent unless sanitary conditions on the farm are given careful attention. The greatest losses among hogs are caused by hog cholera. Next in importance is tuberculosis. Other causes are hog "flu" and external and internal parasites. Hog cholera and tuberculosis are germ diseases, and animals contract them only by coming in direct contact with the disease germs. Insanitary hog lots and buildings

may not produce these diseases, but they will have a permanently bad effect on the vitality of the animal. Naturally the animal with the greatest vitality will be in better condition to resist the attack of any disease than will the one low in vitality; hence sanitary conditions in the hog lot may have much to do with losses from either of these diseases.

Farrowing houses and sleeping quarters should be kept thoroughly cleaned and supplied with fresh bedding at frequent intervals. The bedding should be changed whenever it becomes damp and foul. This may be necessary in two days, or it may be two weeks. The floors of the sleeping quarters may become not only foul but dusty. Dust is irritating to the lungs and may convey eggs of parasites as well. For this reason floors should be thoroughly cleaned, swept at least every two or three weeks, and disinfected with a 3 per cent solution of compound cresol (U. S. P.).

Pens, as well as feeding places that are not plowed, should have frequent applications of air-slaked lime, which will aid in the drying of damp places and assist in disinfection. All barnyards and lots, on which hogs are kept for any length of time should be plowed at least twice a year as an aid in the disinfection of the premises. Temporary pasture crops can be grown in these lots, thereby making the plowing profitable in two ways.

HOG WALLOWS

A hog wallow made of concrete and located in a convenient, shady place is a benefit in a hog yard, but a mud wallow made by the hogs rooting a hole in the lot or pasture is a nuisance and should not be allowed to remain. It is impossible to keep the mud wallow in anything resembling a sanitary condition. The hogs will often drink of the water which has become stagnant and foul, and consequently it is a source of danger. The concrete wallow should contain from 4 to 6 inches of water and should be cleaned and refilled with fresh water at frequent intervals. Crude oil sufficient to form a thin layer on the water should be poured into the wallow about every 10 days to control lice.

SHADE

Hogs suffer greatly from heat and must be provided with shade of some kind. It is best provided by trees, where a sufficient number close enough together are available. The ordinary farrowing house with low ceiling, commonly used in the North, and the box type or **A**-shaped individual house should not be used for shade. Hogs will seek the shade even though they suffocate. Buildings of the kind stated do not have sufficient air space or circulation. They should be kept closed to prevent hogs from lying in them in hot weather.

A very satisfactory structure for providing shade can be made by constructing a framework about 4 feet in height, using posts, poles, or almost any available material, and covering the top with hay, straw, or weeds to a depth of at least 3 feet. When there is an accumulation of dust under the shelter, wetting the covering by the use of a hose, so that the water drips through, or by water carried and applied, will have the double benefit of laying the dust and cooling the shade. (Fig. 18.)

DISEASES

The two principal diseases from which hogs suffer are hog cholera and tuberculosis, which are discussed briefly below. Hog "flu," or swine influenza, is another disease from which hogs sometimes suffer, the cause of which is unknown. The symptoms are loss of appetite, violent coughing, occasional vomiting, and rise of temperature. The only known treatment is to place them in warm, dry quarters and allow as complete rest as possible, giving them a constant supply of fresh drinking water.

Post-mortem examination is seldom made of the carcasses of animals that die on the farm; consequently the cause of death is not known. Because of the fact that some farm animals have diseases that can be transmitted to hogs, the danger of permitting hogs to eat the carcasses outweighs the food value, and the practice should not be followed.

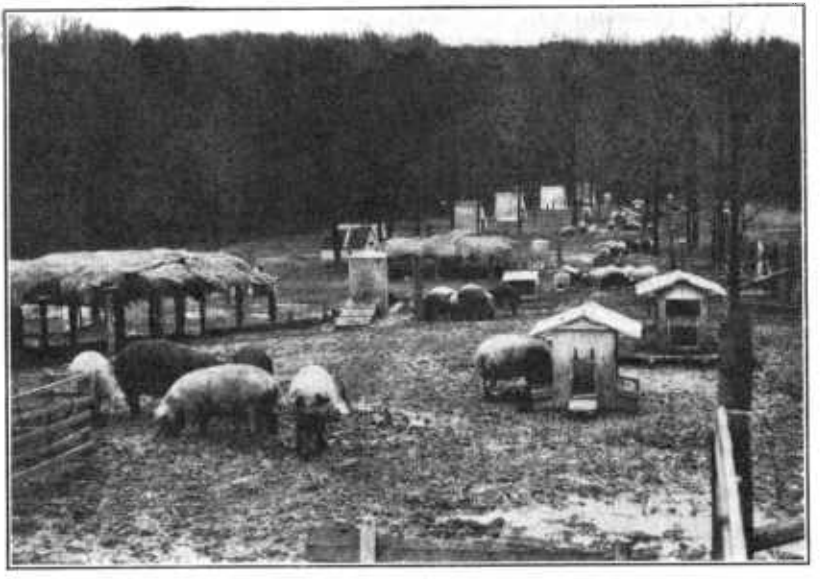

FIG. 18.—Well-equipped paddocks with artificial and natural shade

HOG CHOLERA

Of all the diseases from which hogs suffer, hog cholera heads the list. It is an infectious disease, and the herd is safe from possible attack only when immunized by the virus-serum treatment. Permanent immunity may be had by giving the pigs this treatment when they are young, which makes the operation less expensive than if done later and shortens the time during which they are subject to infection. If a suspicious ailment occurs, it is best to consult a reliable veterinarian, and if the disease is diagnosed as hog cholera all the uninfected animals should be removed to clean, disinfected quarters and all the hogs in the herd should be immunized with serum and virus as soon as possible. If any of the animals die, the carcasses should be burned to ashes, not buried. Farmers' Bulletin 834 discusses the subject of hog cholera fully.

TUBERCULOSIS

Tuberculosis among hogs in the United States is second only to hog cholera as the cause of losses from disease. The extent to which infection is present in a carcass determines whether a total or partial condemnation of the flesh is necessary or whether it may be safely used as human food.

The source of the disease in hogs is very largely tuberculous cattle. Hogs contract the infection either by drinking unsterilized milk or dairy by-products or by eating grain that has passed undigested through tuberculous cattle. All milk products should be effectively sterilized by cooking before being fed. In order to destroy the disease germs it is necessary to subject the product to the boiling temperature long enough to penetrate the interior of the mass or hold it at a temperature of 140° F. for at least an hour. In some cases the disease is probably transmitted from one hog to another. Fowl tuberculosis is also transmissible to swine. Tuberculosis in hogs can scarcely ever be detected by their appearance, the only reliable known methods of detection being the tuberculin test and slaughter. If hogs sold for slaughter are found to be infected with this disease, it is best to fatten and sell all those remaining in the herd when they are only grades. If purebreds are kept, a reliable veterinarian may be able by means of the tuberculin test to ascertain the diseased animals. All reactors should be slaughtered in an inspected plant. Those failing to react to the test may be retained for breeding purposes, but should be subjected to a retest in from 60 days to 6 months. This subject is discussed in detail in Farmers' Bulletin 781.

PARASITES

Hogs of all ages may be affected with external and internal parasites. Death losses seldom occur from these troubles, but indirect losses occur because the vitality is reduced and this condition does not permit of the best and most rapid development. A hog with reduced vitality is naturally more susceptible to attack by any disease. Pigs and young hogs are affected with parasites to a greater extent than older hogs.

INTESTINAL WORMS

Intestinal worms are common among hogs of all ages and are particularly injurious to young, growing pigs. Pigs become infested with these worms by swallowing the worm eggs which are found in the manure of infested hogs or on the soil of pens, yards, and pastures that have been occupied by infested hogs.

Every yard and lot in which hogs run to any considerable extent should be plowed and seeded to a temporary pasture crop at least once every year; twice a year would be better. Mineral mixtures will not prevent worms in hogs, but will have the effect of helping to keep them in good condition. Good, strong, healthy animals have greater resistance to the effect of worms than those in an unthrifty, weak, and generally run-down condition.

Medicinal treatment for worms must be resorted to when methods of prevention have failed or when the pigs have been neglected and

have become unthrifty. Santonin and calomel are very effective in expelling worms from pigs when given in doses of 2 grains each per pig per day for five consecutive days. Results from this daily treatment are better than those obtained from single doses of 10 grains. Santonin, however, is produced in very small quantities at the present time and its cost makes its use almost prohibitive. The most convenient form in which to give santonin is in combination with calomel in No. 0 gelatin capsules. The capsules are administered by means of a capsule gun in connection with a speculum.

Investigations by the Zoological Division, Bureau of Animal Industry, indicate that oil of chenopodium in doses of 1 fluid dram with 2 ounces of castor oil for 100-pound pigs was effectual in destroying more worms than combinations of santonin and calomel. When santonin and calomel are available, however, the results are usually satisfactory, and the easy method of administering the treatment commends it to hog growers in treating young pigs for worms. All worm treatments should be given when the stomach is empty, and during the entire period of treatment the feed should be reduced at least half.

LICE

Hog lice are probably the most common external parasites affecting hogs. They can be found to some extent in most herds at any time. They sustain life by sucking the blood of the animal and are commonly found inside and back of the ears and in the folds on both the front and hind legs. If left alone they thrive and multiply at all seasons of the year. If the herdsman is alert and gives close attention to the application of the right kind of remedies at the right time, lice can be kept down to the point where the damage is negligible.

The common methods of ridding hogs of lice are dipping, spraying, and using hog oilers and medicated hog wallows.

If hogs are to be kept practically free from lice, they must be dipped or thoroughly sprayed every two weeks, or hog oilers must be kept in good condition where the hogs can get at them at any time.

MANGE

Mange is a skin disease caused by small parasites called mites. It is usually first noticed from the formation of crusty scabs around the eyes and ears, from which it spreads to the neck and shoulders, along the back and sides, and finally covers the entire body. The hair is stiff and erect, giving the pig a very unthrifty appearance. Hogs of any age may be affected with mange. Because of the habit that hogs have of lying close together, the disease spreads rapidly from one animal to another. Hogs kept in good, dry, clean, well-bedded quarters are seldom affected with mange. It usually affects hogs that are allowed to sleep in damp, dark sheds or barns or on manure piles or old, damp, straw piles.

The same remedies and treatments recommended for lice should be used for mange. Farmers' Bulletin 1085 treats of the subject of hog lice and mange.

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